THE EFFECT OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI

Dissertation submitted to

THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY

CHENNAI

IN PARTIAL FULFILLMENT OF REQUIREMENT

FOR THE AWARD OF DEGREE OF

MASTER OF SCIENCE IN NURSING

APRIL 2016

THE EFFECT OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI

Certified that this is the bonafide work of

Reg. No: 301411706,
MEDICAL SURGICAL NURSING,
THANTHAI ROEVER COLLEGE OF NURSING,
PERAMBALUR.

COLLEGE SEAL :

SIGNATURE : _____

Prof.R.PUNITHAVATHI, M.Sc (N).,
Principal,
Thanthai Roever College of Nursing,
Perambalur, Tamil Nadu.

Dissertation submitted to

THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY
CHENNAI

IN PARTIAL FULFILLMENT OF REQUIREMENT
FOR THE AWARD OF DEGREE OF

MASTER OF SCIENCE IN NURSING

APRIL 2016

THE EFFECT OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI

Approved by the Dissertation Committee On : _____

Research Guide :_____

Prof.R.PUNITHAVATHI, M.Sc (N).,
Principal,
Thanthai Roever College of Nursing,
Perambalur, Tamil Nadu.

Clinical Specialty Guide :_____

Prof.V.J. ELIZABETH M.Sc. (N).,
Vice-principal,
Thanthai Roever College of Nursing,
Perambalur, Tamil Nadu.

Dissertation submitted to

THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY
CHENNAI

IN PARTIAL FULFILLMENT OF REQUIREMENT
FOR THE AWARD OF DEGREE OF

MASTER OF SCIENCE IN NURSING

APRIL 2016

_____ _____

INTERNAL EXAMINER **EXTERNAL EXAMINER**

DECLARATION

I, 301411706 hereby declare that this dissertation entitled **A STUDY TO ASSESS THE EFFECTIVENESS OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI** has been prepared by me under the guidance and direct supervision of **Prof. R. PUNITHAVATHI, M.Sc (N).,** Principal, Thanthai Roever College of Nursing, Perambalur, as requirement for partial fulfillment of **M.Sc Nursing** degree course under **The Tamilnadu Dr. M.G.R. Medical University.** This dissertation had not been previously formed and this will not be used in future for award of any other degree or diploma. This dissertation represents independent original work on the part of the candidate.

Place: Perambalur,
Date: April – 2016.

301411706,
II Year M.Sc (N) Student,
Thanthai Roever College of Nursing,
Perambalur**.**

ACKNOWLEDGEMET

I hereby offer my heartfelt gratitude to the King of kings and the Lord of lords, the Almighty God who makes all things beautiful in His own time. His grace and blessing was my strength throughout this study.

With profound sentiments and gratitude, I acknowledge the encouragement and help which I received from the following persons for the successful completion of this study.

I consider it as a privilege to express my gratitude and respect to all those who guided and inspired me in the completion of this project.

I express my sincere gratitude to **Dr. K. Varadharaajen, BA. BL., Chairman and Managing Trustee, Thanthai Roever College of Nursing, Perambalur** for providing me an opportunity to pursue this Post Graduate programme in this esteemed institution.

I would like to express my gratitude to my guide **Prof. R. Punithavathi, M.Sc. (N).**, **Principal Thanthai Roever College of Nursing** for her valuable suggestions, encouragement and keen interest in the planning and execution of the study.

I would like to express my gratitude to **Prof. V.J. Elizabeth., M.Sc. (N).**, **Vice Principal Thanthai Roever College of Nursing** who gave me valuable suggestions, guidance and encouragement which shaped and fashioned my study and spared her precious time to complete my study.

I express my words of appreciation to **Mr. Venkata raman, M.Sc.,** Statistician, for his guidance and suggestions in the statistical analysis of the data. His expert validation in the statistical analysis procedures helped in great measure.

My heartfelt gratitude to the Village president **Mr.Mariappan**, Melanalandhula for giving permission to conduct the study.

I owe my gratitude to **all the subjects** who enthusiastically participated in carrying out the research project. I appreciate their keen interest, patience and cooperation evinced for successful completion of the study.

My gratitude to **Mrs.V.Bakkiya lakshmi M.Phill.Librarian of Thanthai Roever College of Nursing and** all the library staffs of **Tamilnadu Dr. M.G.R. Medical University, Chennai** for their support and guidance in procuring the literature related to the study.

It is my immense pleasure to express my heartiest gratitude to my family members, **Mr. Krishna samy** my dear father for his moral support and priceless encouragement**, Mrs. Krishna Jayanthi** my dear mother for her kind unconditional help, love and encouragement from birth till now. I am extremely thankful to my husband **Mr.R.Sathish** and sister K.Karthika**,** for his support and motivation throughout my career.

My heartfelt thanks to all my **friends** for their constant support, co-operation and mutual aid during the study. As a final note I, the investigator, owe a deep sense of gratitude to all those who have directly or indirectly contributed to the successful completion of this endeavor.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

THE EFFECT OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI."

ABSTRACT

INTRODUCTION:

WHO reports worldwide osteoarthritis affects 9.6% of men and 18% of women ages above 60 years and condition will be the fourth leading cause of disability by 2020

OBJECTIVES: To assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis.

METHODS:

True experimental pretest and post test design was adopted; the study was conducted in Melanalandhula village at Tirunelveli. sixty patients selected by simple random sampling method and 30 were recruited to each group used tool for knee injury osteoarthritis outcome score scale to assess the knee related symptoms, Experimental group received Epsom salt fomentation twice a day for 14 days

RESULT:

In experimental group post test mean score was 19.90 ± 3.97 and control group post test mean score was 36.46 ± 4.30 calculated t value 15.482 was statistically significant at $p<0.001$ level.

DISCUSSION:

The study proved that Epsom salt fomentation is found to be effective in reduction knee related symptoms among patients with knee osteoarthritis.

CHAPTER-1

INTRODUCTION

Aging is a natural process. As people become older the functioning and adaptability of the tissues and different organs decline and chances of suffering of geriatric populations are more. It has been projected that by the year 2025 there will be 1.2 billion older persons, with two out of three living with osteoarthritis in a developing country. WHO reports (2010) worldwide, osteoarthritis affects 9.6% of men and 18% of women ages above 60 years or older and the condition will be the fourth leading cause of disability by 2020. Osteoarthritis in the aging population will generate a global avalanche of costs and disability.

Osteoarthritis is a chronic inflammatory disorder and usually presents as joint pain with structural changes, crepitus, bony enlargements, morning stiffness, deformity, instability and restriction of movements. Advanced disease stages can lead to substantial loss of functioning and mobility, disruption of the immunological tolerance as well as the psychological condition by further weakening the immune system of people concerned could play a major role.

India is likely to notice an endemic osteoarthritis with 80% of the above 65 years population suffering with wear and tear of joints. 40% of these people are likely to suffer from severe osteoarthritis, which will disable from daily activities. (WHO 2013).

Epsom salt is so named because it was discovered in EPSOM, England in the late 1600s. Its scientific name is magnesium sulfate and it has soothing

benefits. It helps to maintain the proper functioning of muscles and nerves within the body, as well as maintain bone and joint strength. (NATIONAL HEALTH SCIENCES 2010). Scientists have learned that the best way to get magnesium into the body is topically through the skin. A hot Epsom salt is the old New England home remedy for arthritis pain.

Heat applications have four main effects on body tissues, including pain relief, muscle relaxation, vasodilatation, and connective tissue relaxation. Whitney (2003) performed a systemic review of 12 clinical studies and concurred that systematic and local warming of tissues produces physiological and cellular responses in the local wound environment conductive to wound healing.

NEED FOR STUDY

Joint diseases affect millions of people throughout the world, causing pain and disability with great impact on individuals and on society as a whole. Osteoarthritis is the most common joint disease in the near future and is projected to rank second for women and fourth for men in the developed countries in terms of years lived with disability. Men are more often affected than women before the age of 50. Women are affected twice as often as men after the age of 50.

Osteoarthritis is most commonly seen in clinical practice usually involving one or two knee joint. Although there is no known cure for most forms of arthritis, and treatment designed for individual patient can reduce or eliminate symptoms and limit functional impairment. The goals of contemporary management of arthritis extend beyond pain control to the enhancement of patients functional status and health-related quality of life.

Lizy Sonia.A, & Latha venkatesan (2014) assessed the work related disability among patients with arthritis in Apollo hospitals, Chennai and reported that significant percentage of patients had severe work related disability (57%), and moderate work related disability (43%).

Pharmacotherapy with non steroidal anti inflammatory drugs, cyclooxygenase II (Cox II) inhibitors are prone to develop severe side effects. Topically applied NSAIDs are also useful to a certain extent, so there is a help felt to evaluate and to implement effects of alternative modalities like exercise, olive oil applications to manage the discomfort of the patient.

Parmelee et al examined cross sectional and longitudinal associations of self reported sleep disturbance with OA related pain and disability and depressive symptoms. At baseline, 367 persons with physician diagnosed knee OA reported sleep disturbances, pain, functional limitations, and depressive symptoms. Result showed sleep was independently associated with pain and depression but not disability.

Epsom salt is a naturally occurring pure mineral compound of magnesium sulphate that has long recognized as a reliable treatment for muscle aches and joint pain. However, relieving muscle soreness is only one of the many benefits Epsom salt has to offer.

During the clinical experience the investigator witnessed that more number of elderly people expressed knee related symptoms and its serious impact on their quality of life and wellbeing. I as a researcher identified the expressed need as a significant problem and interested to assess the effect of Epsom salt fomentation which is simple effective measure to reduce the knee related symptoms, which emerged as her present study.

STATEMENT OF THE PROBLEM

"A study to assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis in selected village at Tirunelveli."

OBJECTIVES OF THE STUDY

1. To assess the level of knee related symptoms among patients with knee osteoarthritis.
2. To assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis.
3. To find the association of pre test level of knee related symptoms among patients with knee osteoarthritis with their selected demographic variables in the experimental group.

RESEARCH HYPOTHESES

- H1; There will be a significant difference in knee related symptoms among patients with knee osteoarthritis after Epsom salt fomentation.
- H2; There will be a significant association between pre test level of knee related symptoms and selected demographic variables of patients with knee osteoarthritis who received Epsom salt fomentation.

OPERATIONAL DEFINITIONS

EFFECTIVENESS

It refers to the extent to which Epsom salt fomentation become successful in reducing knee related symptoms patients who have osteoarthritis.

OSTEOARTHRITIS

It is an inflammatory joint disease marked by degeneration of the articular cartilage, hypertrophy of bone at the margins and changes in the synovial membrane accompanied by pain and stiffness in the knee joint.

KNEE RELATED SYMPTOMS

Symptoms perceived and expressed by the patient in terms of pain, swelling, stiffness, congestion as a result of deterioration of the involved knee joint which will be measured by knee injury and osteoarthritis outcome score scale

EPSOM SALT FOMENTATION

It is a local application of moist heat by means of small bag of cotton cloth with 50 mg Epsom salt dipped in hot water (140 degree Fahrenheit). It is applied on the affected knee joint for 10 minutes twice a day for 14 days.

ASSUMPTIONS

- Patients with knee osteoarthritis have pain, swelling, inflammation.
- Epsom salt fomentation improves the tone of supportive cartilages, ligaments enhances joint flexibility and relieves knee related symptoms.
- Epsom salt fomentation reduces pain and inflammation.

DELIMITATION

- The study is limited to only patients with knee osteoarthritis.
- The study is delimited to 4 weeks period
- The study is limited to only one setting.

PROJECTED OUTCOME

The findings of this study will reveal the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis. If found to be effective this intervention could be incorporated as one of the nursing measures to reduce the knee related symptoms among patients with knee osteoarthritis.

CHAPTER- II

REVIEW OF LITERATURE

The review of related literature is an essential aspect of scientific research. It entails the systematic identification, reflection, critical analysis and reporting of existing information in relation to the problem of interest. The purpose of review of literature is to obtain comprehensive knowledge and depth information about the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis.

This chapter consists of review of literature fewer than four headings.

SECTION A- Review related to knee related symptoms associated with osteoarthritis
SECTION B- Review related to treatment of osteoarthritis
SECTION C–Review related to hot application of osteoarthritis
SECTION D – Review related to Epsom salt application for osteoarthritis

SECTION- A REVIEW RELATED TO KNEE RELATED SYMPTOMS ASSOCIATED WITH OSTEOARTHRITIS

Maggle Sullivan et al., (2013) conducted a descriptive study from 1192 Africans and Caucasians to evaluate pain severity and mobility limitations in osteoarthritis knee patients. Multiple logistic regression analysis showed that 43% reported difficulty in performing 1 task. Mild radiographic knee osteoarthritis was associated with difficulty in mobility like mobility like climbing, taking a tub bath, getting in and out of car. Moderate pain was associated with difficulty in performing 17 out of 20 tasks, except lifting a

cup, opening car door, and turning faucets. Knee pain severity was the strongest risk factor for self reported difficulty in performing upper and lower extremity tasks.

Tveit M et al., (2012) conducted an experimental study to assess the physical function of older clients with clinical knee osteoarthritis. 106 sedentary subjects more than 60 years (mean 69.4, standard deviation 5.9) with knee osteoarthritis (mean 12.2, standard deviation 11.0) were participated in the study. Mobility, joint flexibility and muscle strength were evaluated by recording time to ascend 8 of descend 4 stairs, rise from sitting or sit down from chair (5 times). Using Spearman correlation walking, stairs climbing, chair rise were significantly correlated with each other and with the pain rating scale index ($p<0.001$).

Orita.s.koshi et al., (2011) conducted a Comparative study at New York to investigate the movement and muscle activation strategies during walking of individuals with medial knee osteoarthritis. 28 cases and 26 controls were participated. Knee instability was assessed with activities of daily living scale and knee motion was assessed by motion analysis. Independent's test and regression analysis revealed that osteoarthritis group used less knee motion and higher Muscle co-contraction during weight acceptance which was found to be detrimental to joint integrity.

Guh et al., (2009) conducted an experimental study to determine whether knee osteoarthritis reduces ambulatory capacity and impairs quality of life. 56 subjects were selected with and without knee osteoarthritis. 6 minutes walk test results showed that vital oxygen peak was significantly higher in the controls when compared with patients. The subjects without knee osteoarthritis walked a significantly longer distance than clients with

knee osteoarthritis. A significant negative correlation between pain and physical limitation was observed.

Zifchockr et al, (2000) conducted an exploratory study to understand the experience of living with knee osteoarthritis in older adults. Nine interviews conducted to participants with physician - diagnosed knee osteoarthritis of different ages, sexes, cultural backgrounds and self-perceptions. The results showed living with knee osteoarthritis emerged experiencing knee pain is central to daily living experiencing mobility limitations devalues self-worth, sharing the experience, assessing our own health and managing chronic pain.

SECTION- B REVIEW RELATED TO TREATMENT OF OSTEOARTHRITIS

Moonaz SH et al (2015) evaluated the effect of integral-based yoga in sedentary people with arthritis. There were 75 sedentary adults aged 18 years with rheumatoid arthritis or knee osteoarthritis randomly assigned to 8 weeks of yoga. Participants were mostly female (96%), white (55%) and college-educated (51%) with a mean age of 52 years. Twenty two out of 28 in the waitlist group completed yoga. Preliminary evidence suggests yoga may help sedentary individuals with arthritis safely increase physical activity, and improve physical and psychological health.

J.H.Abbott et al.,(2013) evaluated the clinical effectiveness of manual physiotherapy and exercise physiotherapy in addition to usual care for patients with osteoarthritis of the knee, through factorial randomized controlled trial, 206 adults who met the criteria were randomly allocated to receive manual physiotherapy (n-54) multi-modal exercise physiotherapy (n=51) combined exercise and manual physiotherapy (n=50), or no trial

physiotherapy (n=51).The primary outcome was change in the western Ontario and Mc Master osteoarthritis index after 1 year. The study concluded that manual physiotherapy provided benefits over usual cares that were sustained to 1 year.

M.S. Corbett et al., (2013) conducted a study to compare the effectiveness of acupuncture with other relevant physical treatments for alleviating pain due to knee osteoarthritis. End of treatment results showed that eight interventions: interferential therapy, acupuncture, TENS, pulsed electrical stimulation, balneotherapy, aerobic exercise, sham acupuncture, and muscle-strengthening exercise produced a statistically significant reduction in pain when compared with standard care.

Chen J.S et al., [2013] determined the effect of fish oil on bone mineral density [BMD], among 202 participants aged >40 with knee osteoarthritis in Australia. Samples were randomized to receive either high dose[4.5g/day] or low dose[0.45g/day] omega-3 fish oil for 2 years .The results suggested that high-dose omega-3 fish oil did not alter bone loss among men and women with knee osteoarthritis.

Bartels EM, Lund H, Hagen KB (2007), compared the effectiveness and safety of aquatic-exercise interventions in the treatment of knee and hip osteoarthritis. Results show that there is a lack of high-quality studies in this area. In total, six trials (800 participants) were included. At the end of treatment for combined knee and hip osteoarthritis, there was a small-to-moderate effect on function (SMD 0.26, 95% confidence interval (CI) 0.11 to 0.42) and a small-to-moderate effect on quality of life (SMD 0.32, 95% CI 0.03 to 0.61). A minor effect of a 3% absolute reduction (0.6 fewer points on a 0 to 20 scale) and 6.6% relative reduction from baseline was found for pain. Aquatic exercise appears to have some beneficial short-term effects for

patients with hip and/or knee OA while no long-term effects have been documented. Based on this, one may consider using aquatic exercise as the first part of a longer exercise programme for osteoarthritis patients.

SECTION – C REVIEW RELATED TO HOT APPLICATION OF OSTEOARTHRITIS

Shunsukeochiai et al., [2014], determined the effectiveness of thermotherapy using a heat and steam generating sheet among patients with knee osteoarthritis in Japan.22 females aged 50-69 were randomly assigned to either a local heat treatment [LH] group or an exercise therapy group [ET].The samples were subjected to a 12 week intervention experiment. For clinical evaluation, the Japanese knee osteoarthritis measure [JKOM] was performed. There is significant decrease in JKOM score in LH group than ET group. Results showed that thermotherapy was effective when using a steam generating sheet

WafaaI shereif et al., [2011], analyzed the uses of therapeutic exercise and heat application on improvement of physical function among patients with knee osteoarthritis.90 osteoarthritis patients are randomly selected and divided into three groups. Group 1 received training to use heat application with pharmacological treatment, group 2 received training of physical exercise with pharmacological treatment, and group 3 received a combination training of physical exercise and heat application with pharmacological treatment. The results showed that the use of a combination of therapeutic exercise and heat application together was effective.

Yildirim et al., [2010], studied the effect of superficial local heat application on pain, stiffness, physical function and quality of life in patients with knee osteoarthritis.46 patients with knee osteoarthritis were divided into

two groups as intervention and control groups. Statistically significant differences were found between the control and intervention group patients in terms of changes in the scores for physical function ,pain, and general health perception[$p<0.05$].The results showed that heat application reduce pain and increase the physical function in patients with knee osteoarthritis.

Rose jenila. J (2007) conducted an experimental study to evaluate the effectiveness of a study to assess the effectiveness of hot and cold application on arthritic pain and mobility status among clients with osteoarthritis .The result showed significant improvement of the hot application reduced pain than cold application.

Rabini .A et al., [2007], compared and determined the effects of deep heating therapy and superficial heat therapy among 44 patients with knee osteoarthritis at outpatient clinic of the department of geriatrics, Gerontology University and hospital. Deep heating therapy with local microwave diathermy and short heating therapy with hot packs application was given for three 30 minutes sessions a week for four weeks. WOMAC index was used for the assessment of joint pain and physical function limitations. British medical research council [BMRC] rating scale was used for muscle strength evaluation and visual analogue scale was used for pain assessment .The results showed that deep heating therapy via localized microwave diathermy improves pain, muscle strength, and physical function in patients with knee osteoarthritis.

J.H.Abbott et al., (2000) conducted a prospective randomized study to evaluate the effectiveness of the dry heat sheet. 37 patients using the heat steam generating sheet and 17 using the dry heat generating sheets, who used the sheets continuously for 4 weeks, were studied. The pain rating scale score was used. The result showed significant improvement of the total pain rating

scores with heat generating steam group, but no significant change was observed in the dry heat generating sheet group.

SECTION- D REVIEW RELATED TO EPSOM SALT APPLICATION FOR OSTEOARTHRITIS

Ruby Anitha et al., (2015) conducted a study to assess the effectiveness of Epsom salt fomentation on knee joint pain, knee swelling and activities of daily living among elderly. It was one group pretest post test experimental design with 30 samples. Results reveals with significant improvement ($p<0.01$) in pain, swelling and activities of daily living after 5 days of therapy.

Jaslina Gnanarani (2014) evaluated the effectiveness of magnesium sulphate dressing in reducing pain perception and swelling at the intravenous infiltration site.post assessment of pain and swelling in the experimental group showed a highly significant reduction in pain perception and swelling in comparison with the control group of patients.

Nidhi Sofat et al., (2013) conducted a true experimental study to assess the effectiveness of magnesium sulphate application of osteoarthritis pain. Random sampling technique using descriptive pain scale to assess the pain, in the result experimental group showed that effective in magnesium sulphate application comparison with the control group.

Jomen joy (2009) conducted a true experimental study to evaluate the effectiveness of hot water application with Epsom salt and plain water among old age with joint pain. Using descriptive scale assessment of pain in the result experimental group showed that effective in hot water application with Epsom salt in comparison with the control group of patients.

The above reviewed literatures showed the promising effect of Epsom salt fomentation on knee related symptoms and this study proposes to evaluate the effect of Epsom salt fomentation on reduction of knee related symptoms among patients with osteoarthritis.

PART- II

CONCEPTUAL FRAMEWORK

The conceptual framework of the study was derived from the modified Wiedenbach's Helping Art clinical Nursing theory (1964).

According to the theory, the nursing is involved in three components.

- Identifying need for help
- Ministering the need for help
- Validating that need for help was met

In this study the nurse investigator attaining the goal through 3- steps of Wiedenbach's perspective theory.

STEP- I
IDENTIFYING A NEED FOR HELP

GENERAL INFORMATION

For collecting general information the investigator collect information, generally through Demographic variables such as age, sex, type of physical activity, body mass index, duration of knee osteoarthritis, treatment and pre-test collect information about the level of knee related symptoms as mild, moderate and severe and Extreme

THE CENTRAL PURPOSE

According to the theory, the central purpose refers to what the nurse wants to accomplish. It is the overall plan towards nurse strives. It transcends the immediate intend of the assignment or task by specially directing activities towards the clients goal. In this study the central purpose was the reduction of knee related symptoms

THE PRESCRIPTION

According to the theory the prescription refers to the plan of care for patients. It specifies the nature of action that will fulfill the nurse's central purpose and the rationale for that action. After the prescription is established plan, the nurse can implement it through the nursing care plan.

STEP-II
MINISTERING THE NEED FOR HELP

The nurse formulates a plan for meeting the clients need for help based on available resources. The nurse presents the plan to the patients and the patient's response to it.

REALITIES

It refers to the physical, physiological, emotional and spiritual factors that come into play in a situation involving nursing action. Wiedenbach's defines the 5- realities as agent, recipient, goal, need and framework.

The agent is the nurse who provides nursing care. In this study it refers to the researcher; direct all action toward the goal.

The recipient is the patients who have problems, capabilities and abilities to cope with the concerns or problems being experienced. In this study recipients are patients with knee osteoarthritis.

The goal is the nurse desired outcome the nurse wishes to achieve. In this study it refers to the reduction of knee related symptoms.

The mean comprise the activities and devices used by the nurse to achieve the goal. In this study using Epsom salt fomentation for 10 minutes twice a day for 14 days according to the knee related symptoms

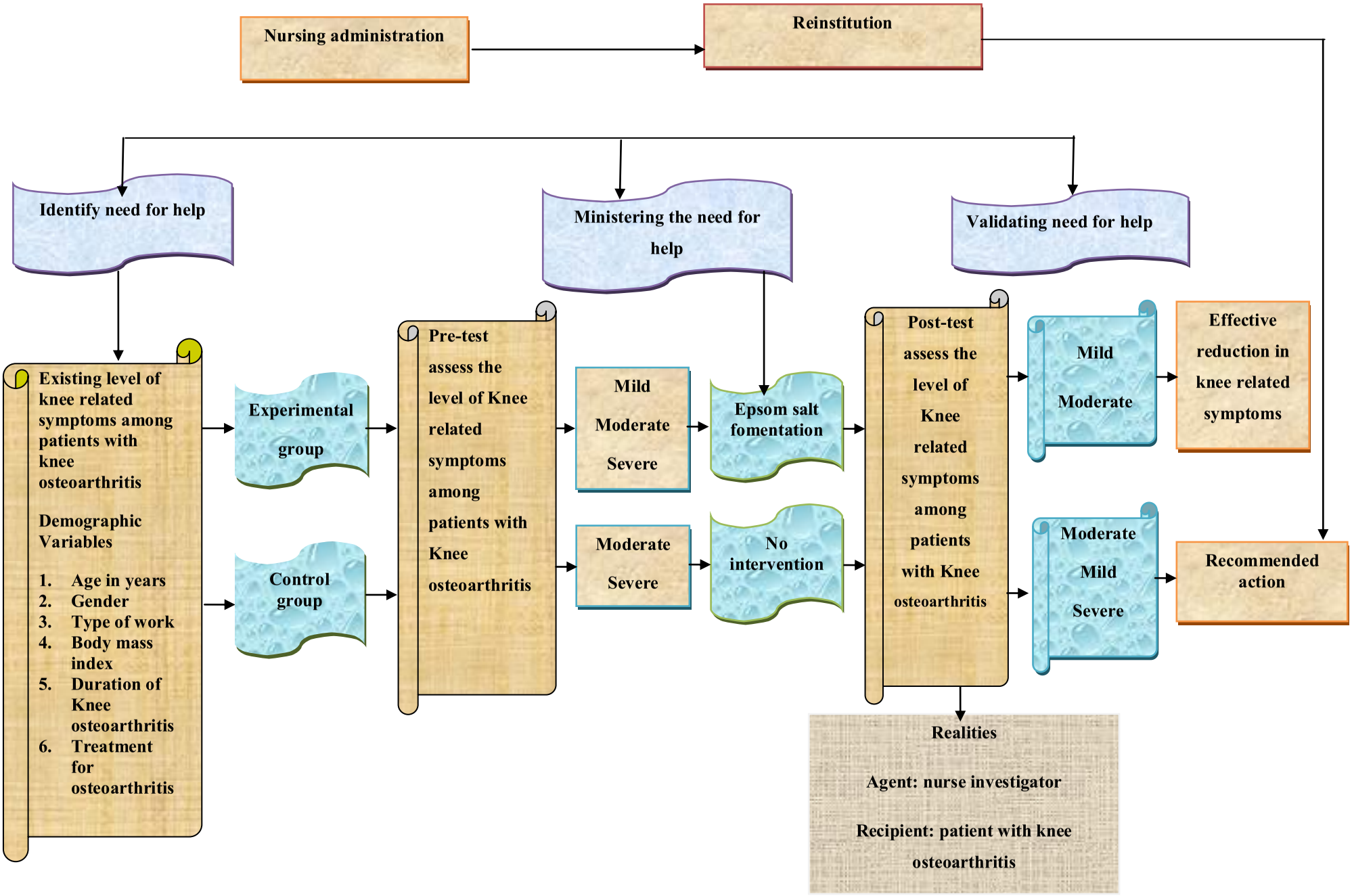
The framework consists of the human, environment, professional and organizational facilities. In this study knee osteoarthritis patients were selected village at Tirunelveli.

STEP-III

VALIDATING THAT NEED FOR HELP WAS MET

The nurse perceives the patient behavior consistent or inconsistent with the nurse concept of comfort of capability. It refers to a collection of evidence that shows patients need have been met and that his or her functional ability has been restored as a direct result of the research action. It is based on patient oriented evidence. This step involves post-test assessment and that score after ministering analysis to infer the outcome.

FIGURE: 1 MODIFIED WIEDENBACH'S HELPING ART CLINICAL NURSING THEORY (1964)



CHAPTER – III

RESEARCH METHODOLOGY

This chapter deals with the methodology adopted by the investigator to assess the effectiveness of Epsom salt fomentation among patients with knee osteoarthritis.

RESEARCH APPROACH

An Evaluative approach

RESEARCH DESIGN

True experimental pre-test and post test control group design.

GROUPS	PRE TEST	INTERVENTION	POST TEST
Experimental group	01	X	02
Control group	01	--	02

01 - Pretest measurement of knee related symptoms,

X - Intervention,

0 - Posttest measurement of knee related symptoms,

VARIABLES

Dependent variable: Knee related symptoms

Independent variable: Epsom salt fomentation

SETTING OF THE STUDY

Melanalandhula village at Tirunelveli district

POPULATION

Patients with knee osteoarthritis

TARGET POPULATION

Patients with knee osteoarthritis having knee related symptoms.

ACCESSIBLE POPULATION

Patients with knee osteoarthritis having knee related symptoms residing at the Melanalandhula village at Tirunelveli.

SAMPLE

Samples were patients with knee osteoarthritis who met the inclusion criteria.

SAMPLE SIZE

Sample size was 60; 30 patients for experimental group and 30 patients for control group

SAMPLING TECHNIQUE

Simple random sampling technique

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA

- Both male and female.
- Patients with osteoarthritis who have knee related symptoms
- Patients who are willing to participate
- Patients who reside in Melanalandhula village

EXCLUSION CRITERIA

- Patients who were not willing to participate
- Patients who are having other type of joint pain
- Patients who have other acute illness.

DESCRIPTION OF THE DATA COLLECTION TOOL

Section - A Questionnaire to elicit demographic data.

Section – B Modified Knee Injury and Osteoarthritis outcome score scale.

GRADING PROCEDURE

LEVEL OF KNEE RELATED SYMPTOMS	SCORE
MILD	0-15
MODERATE	16-30
SEVERE	31-45
EXTREME	46-60

CONTENT VALIDITY

The content validity of the tool was obtained from 4 experts in the field of nursing.

PILOT STUDY

In order to test the feasibility relevance and practicability of the study pilot Study was conducted from 6.07.2015 to 12.07.2015 among six samples with the permission of village President. Three samples were taken as control group and three samples for Experimental group & intervention and data collection has done in the same manner as that of the original study. The samples included in the pilot study were excluded in main study. As the pilot study it was decided to proceed the main study without any modification.

DATA COLLECTION PROCEDURE

Data collection was done from 1.07.2016 to 30.07.2016 in Melanalandhula village at Tirunelveli. The objectives of the study were explained to the president and permission obtained .The samples were selected at residents of Melanalandhula village by using simple random sampling technique. The purpose of the study was explained and written consent obtained from all the patients before the study.

On the day 1 the demographic variables was collected and pre test was done for both the groups. The Epsom salt fomentation given to the experimental group alone twice a day for 14 days and end of the 14^{th} day post test assessment of knee related symptoms in both groups by using modified knee injury and osteoarthritis outcome score scale.

PLAN FOR STATISTICAL ANALYSIS

It was planned to analysis and interprets data with the help of descriptive and inferential statistics.

DESCRIPTIVE STATISTICS

Frequency percentage

To describe the demographic variables of patients with knee osteoarthritis.

Mean, standard deviation

To assess the pre test and post test level of knee related symptoms among patients with knee osteoarthritis.

INFERENTIAL STATISTICS

Independent t test

To compare the mean score of knee related symptoms of post test of experimental group, to know effectiveness of Epsom salt fomentation.

Paired t test

To compare the mean score of knee related symptoms of pre test and post test for patients in the same group.

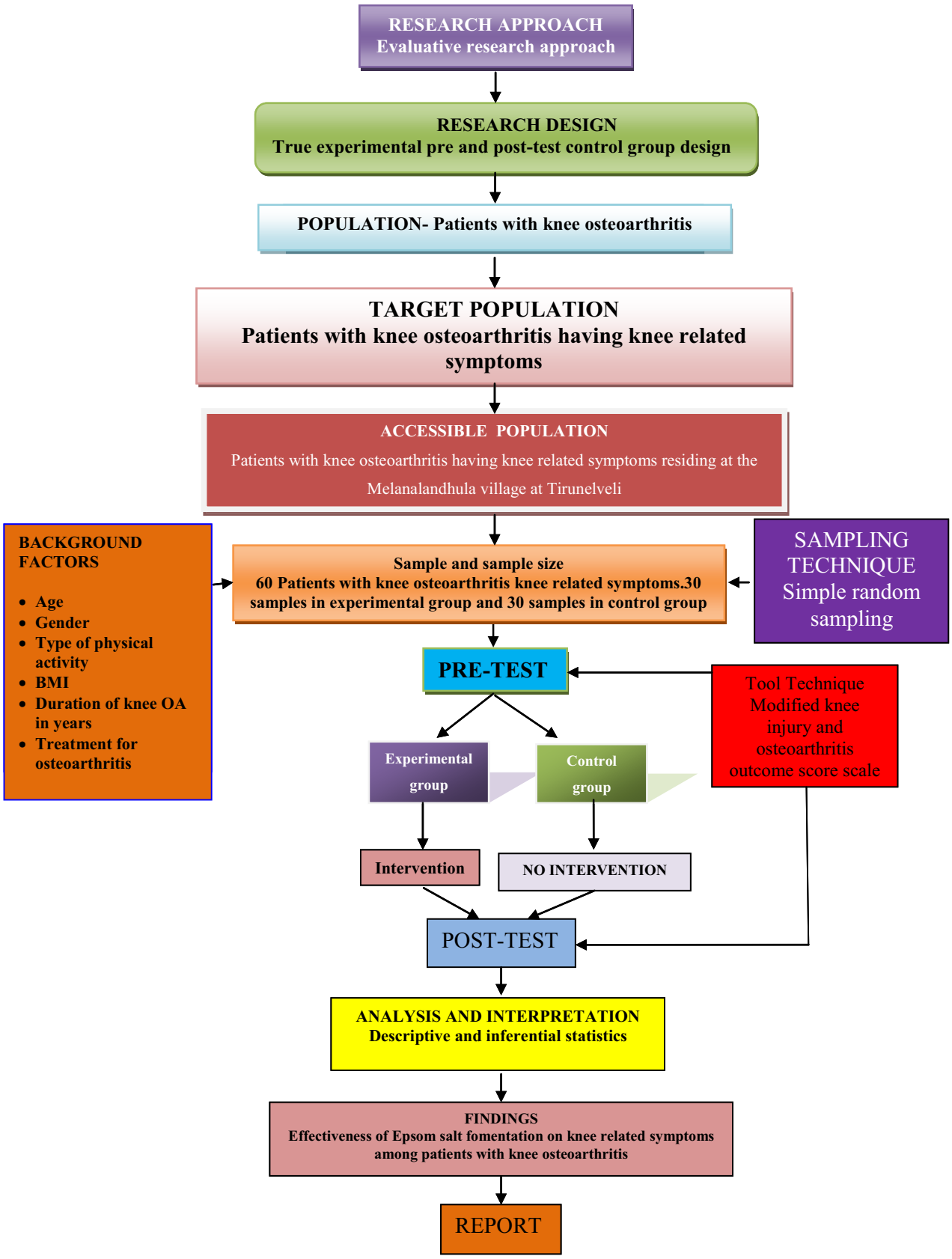
Chi-square test

To find the association between selected demographic variables and pre test level of knee related symptoms.

ETHICAL CONSIDERATIONS

The study was conducted after the approval of ethical committee of the Thanthai Roever College of Nursing. Permission was sought from the village president of Melanalandhula village at Tirunelveli and confidentiality maintained. Informed consent obtained from each participant. Study purpose and intervention were explained to each participant

Fig:2 SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY



CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of data collected from 60 patients with osteoarthritis, to assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis. The data collected were grouped and analyzed as per the objectives set for the study. The findings based on the descriptive and inferential statistical analysis are presented under the following sections.

ORGANIZATION OF DATA

The findings of the study were grouped and analyzed under the following sessions.

Section A: Description of the demographic variables of patients with knee osteoarthritis.

Section B: Pretest and post test level of knee related symptoms among patients with knee osteoarthritis.

Section C: Effectiveness of Epsom salt fomentation on knee related Symptoms among patients with knee osteoarthritis in the experimental group.

Section D: Association of pretest level of knee related symptoms with their selected demographic variables in the experimental group.

SECTION- A

Table 1: Frequency and percentage distribution of demographic variables of patients with knee osteoarthritis.

N = 60(30+30)

Demographic Variables	Experimental Group		Control Group	
	No.	%	No.	%
Age in years				
41-50	6	20.00	7	23.33
51-60	10	33.33	11	36.67
61-70	10	33.33	7	23.33
71-80	4	13.33	5	16.67
Gender				
Male	17	56.67	19	63.33
Female	13	43.33	11	36.67
Type of physical activity				
Sedentary work	9	30.00	9	30.00
Moderate work	12	40.00	11	36.67
Heavy work	9	30.00	10	33.33
Body Mass Index				
Underweight	6	20.00	8	26.67
Normal weight	14	46.67	9	30.00
Overweight	6	20.00	8	26.67
Obesity	4	13.33	5	16.67

Demographic Variables	Experimental Group		Control Group	
	No.	%	No.	%
Duration of knee OA in years				
<1	3	10.00	6	20.00
1 - 3	15	50.00	14	46.67
4 - 5	8	26.67	4	13.33
>5	4	13.33	6	20.00
Treatment for osteoarthritis				
Drug therapy	13	43.33	6	20.00
Physiotherapy	8	26.67	7	23.33
Both	3	10.00	9	30.00
No treatment	6	20.00	8	26.67

The table 1 shows that in the experimental group, majority 10(33.33%) were in the age group of 41 – 50 and 51 – 60 years, 17(56.67%) were male, 12(40%) were moderate worker, 14(46.67%) were normal weight, 15(50%) had 1 – 3 years of duration of knee OA and 13(43.33%) were treated with drug therapy for osteoarthritis.

Whereas in the control group, majority 11(36.67%) were in the age group of 41 – 50yrs, 19(63.33%) were male, 11(36.67%) were moderate worker, 9(30%) were normal weight, 14(46.67%) had 1 – 3 years of duration of knee OA and 9(30%) were treated with both drug therapy and physiotherapy for osteoarthritis.

Fig: 3 Percentage distribution of age of patients with knee osteoarthritis

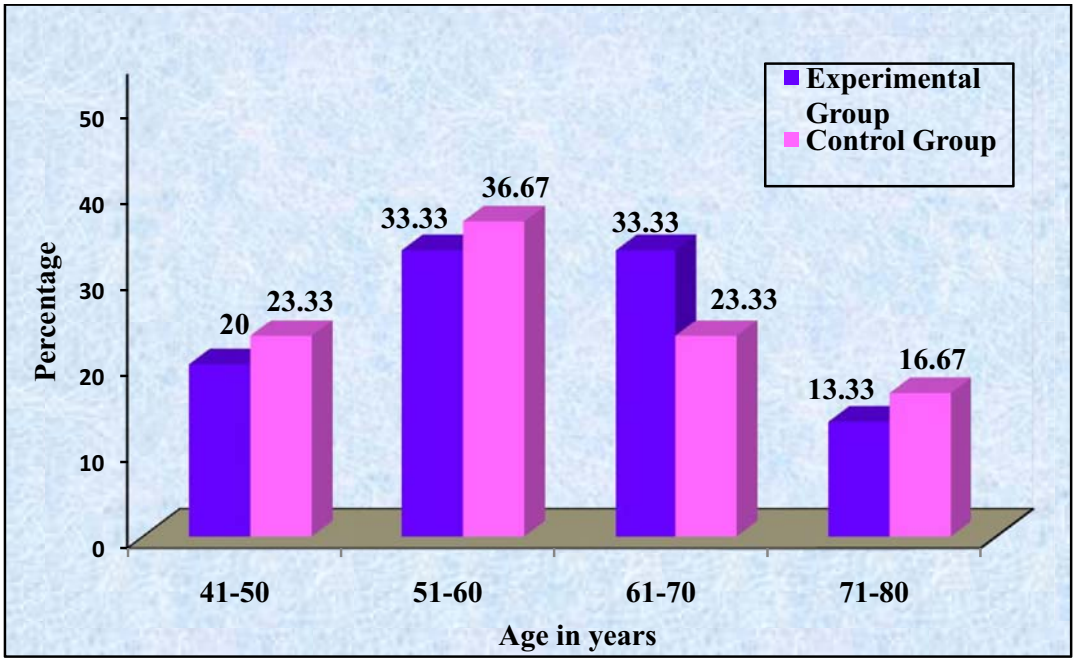


Fig: 4 Percentage distribution of gender of patients with knee osteoarthritis.

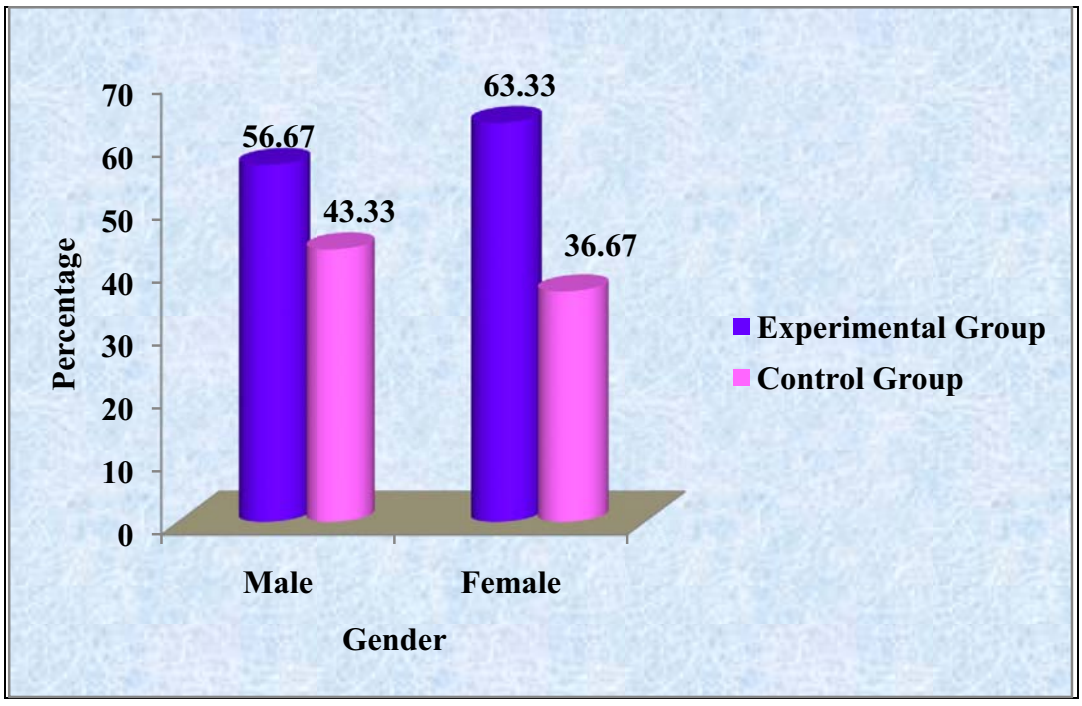


Fig: 5 Percentage distribution of type of work of patients with knee osteoarthritis.

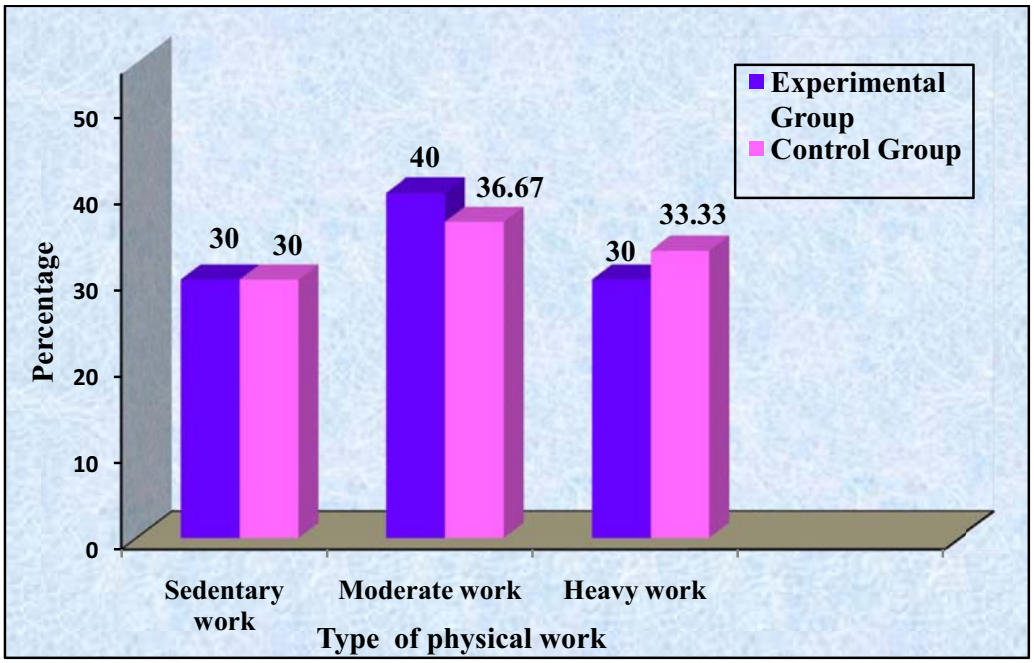


Fig: 6 Percentage distribution of BMI of patients with knee osteoarthritis.

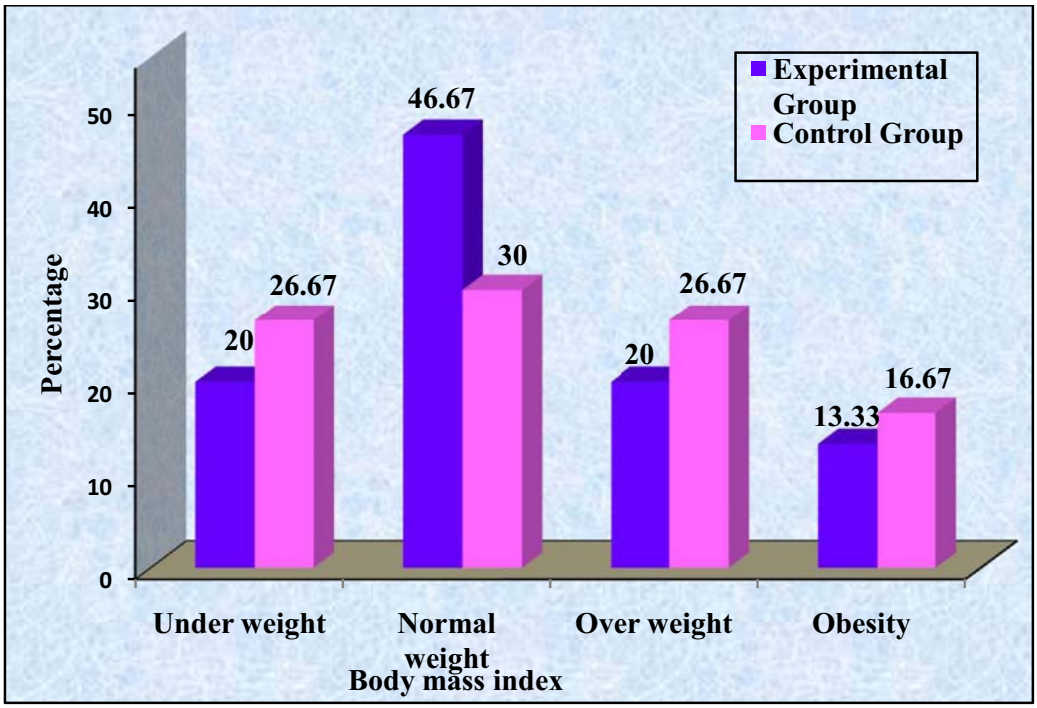
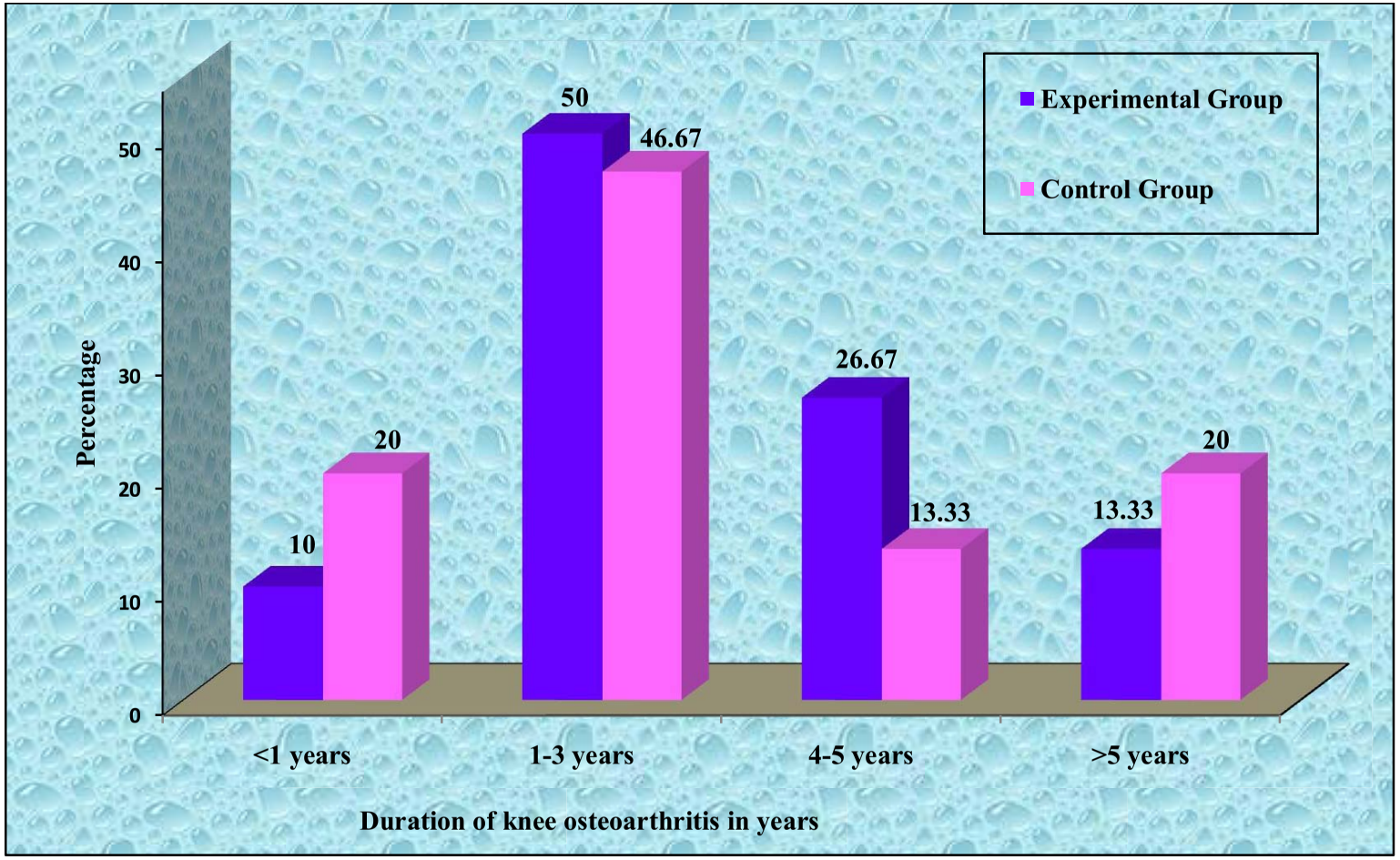


Fig: 7 Percentage distribution of duration of knee OA of patients with knee osteoarthritis



SECTION B

Table 2: Frequency and percentage distribution of pretest and post test level of knee related symptoms among patients with knee osteoarthritis in the experimental group.

n = 30

Level of Knee related symptoms	Pre test Score		Post test Score	
	No.	%	No.	%
None (0)	0	0	0	0
Mild (1 - 15)	0	0	6	20.0
Moderate (16 – 30)	1	3.3	24	80.0
Severe (31 - 45)	23	76.67	0	0
Extreme (46 – 60)	6	20	0	0

The table 2 shows that in the pretest, majority 23(76.67%) had severe level of knee related symptoms, 6(20%) had extreme level of knee related symptoms and only one(3.3%) had mild level of knee related symptoms.

Whereas in the post test majority 24(80%) had moderate level of knee related symptoms and 6(20%) had mild level of knee related symptoms.

Fig: 8 Percentage distribution of pretest and post test level of knee related symptoms among patients with knee osteoarthritis in the experimental group

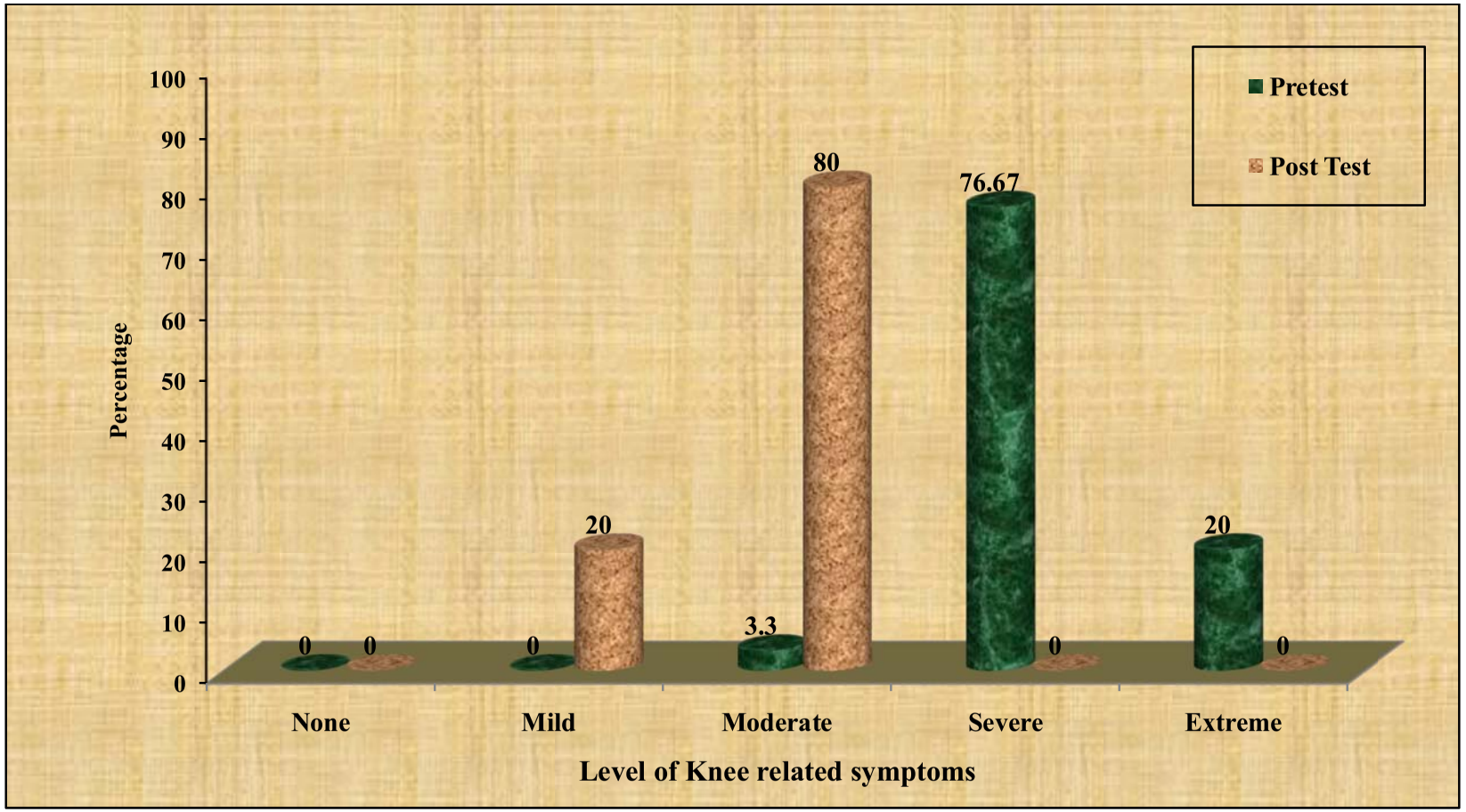


Table 3: Frequency and percentage distribution of pretest and post test level of knee related symptoms among patients with knee osteoarthritis in the control group.

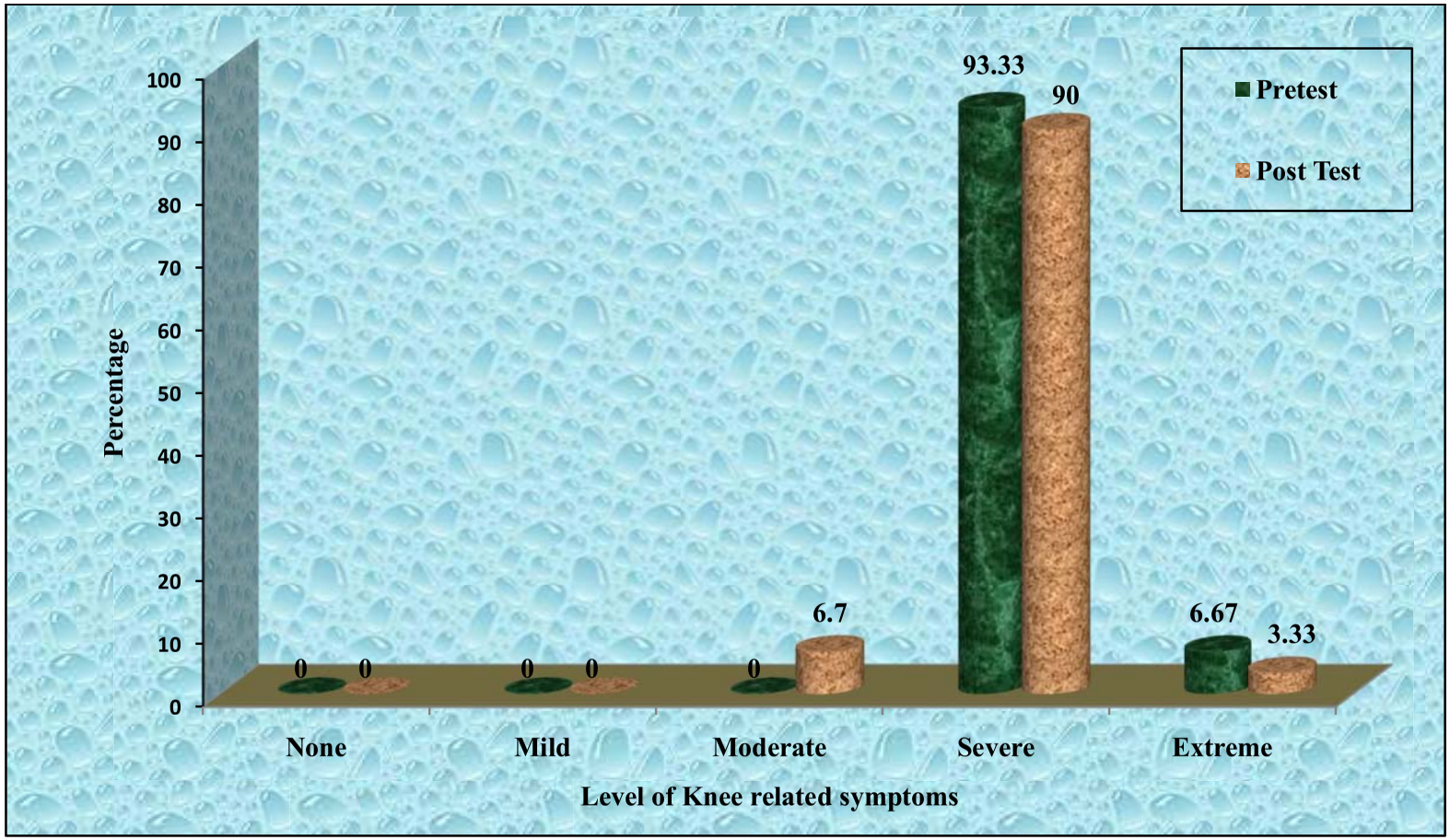
n = 30

Level of Knee related symptoms	Pre test Score		Post test Score	
	No.	**%**	**No.**	**%**
None (0)	0	0	0	0
Mild (1- 15)	0	0	0	0
Moderate (16-30)	0	0	2	6.7
Severe (31- 45)	28	93.33	27	90.0
Extreme (46 – 60)	2	6.67	1	3.33

The table 3 shows that in the pre test, majority 28(93.34%) had severe level of knee related symptoms and 2(6.67%) had extreme level of knee related symptoms.

Whereas in the post test which routine measures, 27(90%) had severe level of knee related symptoms, 2(6.67%) had moderate level of knee related symptoms and only one(3.33%) had extreme level of knee related symptoms.

Fig: 9 Percentage distribution of pretest and post test level of knee related symptoms among patients with knee osteoarthritis in the control group



SECTION C

Table 4: Comparison of pretest and post test mean score of knee related symptoms among patients with knee osteoarthritis in the experimental group.

n = 30

Knee related Symptoms	Total score	Mean	S.D	Mean difference	Paired 't' Value
Pre test	60	41.30	4.41	21.4	t = 31.052 p = 0.000,S***
Post test	60	19.90	3.97		

***p<0.001, S – Significant

The table 4 shows that in experimental group, the pretest mean score of knee related symptoms was 41.30 ± 4.41 and the post test mean score of knee related symptoms was 19.90±3.97. The calculated paired't' value of t = 31.052 was found to be statistically significant at p<0.001 level.

Table 5: Comparison of pretest and post test mean score of knee related symptoms among patients with knee osteoarthritis in the control group.

n = 30

Knee related Symptoms	Total score	Mean	S.D	Mean difference	Paired 't' Value
Pre test	60	38.56	4.45	2.1	t = 2.978 p = 0.000,S***
Post test	60	36.46	4.30		

p<0.001, S – Significant

The table 5 shows that in the control group, the pretest mean score of knee related symptoms was 38.56 ± 4.45 and the post test mean score of knee related symptoms was 36.46±4.30. The calculated paired't' value of t = 2.978 was found to be statistically significant at p<0.01 level

Table 6: Comparison of post test mean score of knee related symptoms among patients with knee osteoarthritis between the experimental and control group.

n = 60(30+30)

Post Test	**Mean**	**S.D**	**Unpaired 't' Value**
Experimental Group	19.90	3.97	t = 15.482 p = 0.000, S***
Control Group	36.46	4.30	

***p<0.001, S – Significant

The table 6 shows that the post test mean score of knee related symptoms in the experimental group was 19.90 ± 3.97 and the post test mean score of knee related symptoms in the control group was 36.46±4.30. The calculated unpaired t' value 15.482 was found to be statistically significant at p<0.001 level.

SECTION D

Table 6: Association of pre test level of knee related symptoms among patients with knee osteoarthritis with their selected demographic variables in the experimental group.

n = 30

Demographic Variables	Moderate (16 – 30)		Severe (31 – 45)		Extreme (46 – 60)		Chi-Square Value
	No.	%	No.	%	No.	%	
Age in years							χ^2=11.757 d.f=6 p = 0.068 N.S
41-50	0	0	5	16.7	1	3.3	
51– 60	1	3.3	9	30.0	0	0	
61 – 70	0	0	8	26.7	2	6.7	
71- 80	0	0	1	3.3	3	10.0	
Gender							χ^2=0.873 d.f=2 p = 0.646 N.S
Male	1	3.3	13	43.3	3	10.0	
Female	0	0	10	33.3	3	10.0	
Type of physical activity							χ^2=3.019 d.f=4 p = 0.555 N.S
Sedentary work	0	0	6	20.0	3	10.0	
Moderate work	1	3.3	9	30.0	2	6.7	
Heavy work	0	0	8	26.7	1	3.3	

Demographic Variables	Moderate (16 – 30)		Severe (31 – 45)		Extreme (46 – 60)		Chi-Square Value
	No.	%	No.	%	No.	%	
Body Mass Index							χ^2=2.109 d.f=6 p = 0.909 N.S
Underweight	0	0	4	13.3	2	6.7	
Normal weight	1	3.3	11	36.7	2	6.7	
Overweight	0	0	5	16.7	1	3.3	
Obesity	0	0	3	10.0	1	3.3	
Duration of knee OA in years							χ^2=11.654 d.f=6 p = 0.070 N.S
<1	1	3.3	2	6.7	0	0	
1 – 3	0	0	13	43.3	2	6.7	
4 – 5	0	0	5	16.7	3	10.0	
>5	0	0	3	10.0	1	3.3	
Treatment for osteoarthritis							χ^2=4.992 d.f=6 p = 0.545 N.S
Drug therapy	1	3.3	9	26.7	4	13.3	
Physiotherapy	0	0	6	20.0	2	6.7	
Both	0	0	3	10.0	0	0	
No treatment	0	0	6	20.0	0	0	

N.S – Not Significant

The table 6 shows that none of the demographic variables had shown statistically significant association with pretest level of knee related symptoms among patients with knee osteoarthritis in the experimental group.

CHAPTER-V

DISCUSSION

This chapter highlights the discussion of the data analyzed based on the objectives and hypotheses of the study. The problem stated is, 'an experimental study to assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis in selected village at Tirunelveli''. The discussion is based on the objectives and the hypotheses specified in the study.

The first objective of the study was to assess the level of knee related symptoms among patients with knee osteoarthritis

In experimental group, pre-test assessment of knee related symptoms revealed that majority 76.67% had severe level, 20% had extreme level and only one 3.3% had mild level of knee related symptoms and in post test majority 80% had moderate level and 20% had mild level of knee related symptoms.

In control group, in pre test majority 93.34% had severe level and 6.67% had extreme level of knee related symptoms and Post test majority 90% had severe level 6.7% had moderate level and only one 3.33% had extreme level of knee related symptoms.

The second objective of the study was to assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis.

In experimental group post test mean knee related symptoms was 19.90 with standard deviation of 3.97 and in the control group it was 36.46 with

standard deviation of 4.30.The mean difference 16.56 and the calculated't value 15.482 was significant at $p< 0.001$ level.

Based on the study findings the stated hypotheses **H1 there will be a significant difference in knee related symptoms among patients with knee osteoarthritis** after Epsom salt fomentation was accepted.

The same significant finding was reported by **Ruby Anitha et al., (2015)** a study to assess the effectiveness of Epsom salt fomentation on knee joint pain, knee swelling and activities of daily living among elderly. It was one group pretest post test experimental design with 30 samples. Results reveals with significant improvement ($p<0.01$) in pain, swelling and activities of daily living after 5 days of therapy.

The third objective of the study was to find the association of pre test level of knee related symptoms among patients with knee osteoarthritis with their selected demographic variables in the experimental group.

There was no significant association between age, gender, body mass index, type of physical activity, duration of knee osteoarthritis, treatment of osteoarthritis with their demographic variables at $p<0.001$ level. Hence the hypothesis **H2 there will be a significant association between pre test level of knee related symptoms and selected demographic variables of patients with knee osteoarthritis** who received Epsom salt fomentation.

CHAPTER- VI

SUMMARY, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSION

This chapter is divided into two sections in the first section summary of the study, findings and conclusion is presented. In the second section implication in various areas of nursing practice, nursing education, nursing administration, nursing research and recommendations for further study are present.

SUMMARY OF THE STUDY

The objective of the study was to evaluate the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis. Evaluative approach and true experimental research design was adopted for the study. Independent variable was Epsom salt fomentation and dependent variable was knee related symptoms. The conceptual framework adopted for the present study was based on modified Wiedenbach's Helping Art clinical Nursing theory (1964).The tool used in this study was knee injury osteoarthritis outcome score scale. The main study was conducted in the 60 samples were recruited through simple random sampling technique. Epsom salt fomentation was done twice a day for 14 days for experimental group and no intervention was given for control group. Post test was done at the end of 14th day. Study result that that experimental group post test mean score of knee related symptoms was 19.90 with standard deviation of 3.97 and in the control group post test mean score of knee related symptoms was 36.46 with standard deviation of 4.30.The difference was 16.56 and the calculated't value

15.482 significant at $p<0.001$ level. Patients in experimental group experienced less knee related symptoms compared to knee related symptoms of control group. There was no significant association found between pre test level of knee related symptoms and selected demographic variables.

MAJOR FINDINGS OF THE STUDY

Majority of the participants

- 33.33% were in the age group of 41 – 50 and 61 – 70 years respectively in the experimental group and 36.67% were in the age group of 41-50 years in the control group.

- 56.67% in experimental group and 63.33% in control group were male.

- 40% in experimental group and 36.67% in control group were doing moderate physical work.

- 46.67% in experimental group and 30% in control group were normal weight.

- 50% in experimental group and 46.67% in control group were having osteoarthritis for 1-3 years.

- 43.33% in experimental group were treated with drug therapy and 30% in control group were treated with both drug therapy and physiotherapy for osteoarthritis.

Findings related to study intervention

1. In pretest experimental group 76.67% and in control group 93.34% had severe knee related symptoms.

2. In post test experimental group 80% had moderate and 20% mild level knee related symptoms and 90% in control group had severe level of knee related symptoms.

3. In experimental group, the pretest mean score of knee related symptoms was 41.30 ± 4.41 and the post test mean score of knee related was 19.90± 3.97. The calculated paired' value of t = 31.052 was found to be statistically significant at $p<0.001$ level.

4. In control group, the pretest mean score of knee related symptoms was 38.56 ± 4.45 and the post test mean score of knee related was 36.46 ± 4.30. The calculated paired' value of t = 2.978 was found to be statistically significant at $p<0.01$ level.

5. In post test mean score of knee related symptoms in the experimental group was 19.90 ± 3.97 and the post test mean score of knee related symptoms in the control group was 36.46 ± 4.30. The calculated unpaired' value of t = 15.482 was found to be statistically significant at $p<0.001$ level.

6. There is no significant association of pre test level of knee related symptoms with age, gender, body mass index, type of physical activity, and duration of osteoarthritis and treatment of osteoarthritis of patients.

IMPLICATIONS

The following implications, which are of vital concern in the field of nursing practice, nursing education, nursing administration and nursing research is derived from the study.

Implications for nursing practice

The nurses have a vital role in providing safe and effective nursing care to enhance the reduction of knee related symptoms among patients with knee osteoarthritis.

Implications for nursing education

1. Educate the students about Epsom salt used in clinical practice.

2. The effect of Epsom salt fomentation in reduction of knee related symptoms for osteoarthritis is to be published in the nursing journals to make awareness among the nursing students.

Implications for nursing administration

1. Conduct in- service programme and continuing nursing education programme for nurses for effective management of knee related symptoms among patients with knee osteoarthritis.

2. The nurse advisers can make awareness among staff nurses about significance of Epsom salt fomentation for reducing knee related symptoms among patients with knee osteoarthritis through workshops and seminars.

Implications for nursing research

As a nurse researcher, promote more research on effective management for knee related symptoms in patients with knee osteoarthritis.

RECOMMENDATIONS

The study recommends the following future research,

- The similar study can be conducted with larger samples for better generalization

- A follow up study can be conducted to find out whether the patients with osteoarthritis are practicing application of Epsom salt fomentation to reduce knee related symptoms.

- A comparative study can be conducted to assess the effect of Epsom fomentation Vs other interventions in the reduction of knee related symptoms

CONCLUSION

The purpose of the study was to assess the effectiveness of Epsom salt fomentation on knee related symptoms among patients with knee osteoarthritis. From the findings it is proved that Epsom salt fomentation found to be effective in relieving Knee Related symptoms.

REFERENCES

BOOK REFERENCES

1. Brunner and Suddarth's "Text book of Medical surgical nursing" 2014, 13th edition, Wolters kluver publishers, New Delhi: 1075-1076.

2. B.T. Basavanthappa "Nursing research", 3rd edition, 2007, Jaypee brothers' publishers, Bangalore: 135-137.

3. B.T. Basavanthappa "Medical Surgical nursing", 1st edition, 2003 Jaypee brothers' medical Publishers, New Delhi; 484.

4. Davidson's "Principles and practice of medicine" 21th edition, 2006 ,Chruchill Livingstone publishers Newyork:1060-1063

5. Geraldine M. collins-Bridel, "Clinical Guidelines for advanced practice nursing, 2nd edition, 2013, Kavin Sullivan publishers, New Delhi:567-581.

6. Harrison's "Principles of Internal medicine" Volume-I, 16th edition, 2005, MC Graw- Hill Medical publisher, New Delhi: 2036.

7. Ignatavicius workman, "Medical surgical nursing" 7th edition, 2013, Elsevier publishers, New Delhi: 319-320.

8. Joyce. M. Black "Medical surgical nursing" 8th edition, 2012 Elseveir publishers, India: 500.

9. Joyce .K. Keithley "Mastering medical surgical nursing" 1st edition, 1998, Matthew cahill publishers' spring house corporation, Pennsylvania: 546-549

10. Javed .Ansari Farukh Khan, "A text book of Medical Surgical Nursing"1st edition 2016, pee vee publishers: 2016-2018

11. Kozier and Erb's "Fundamental of nursing'8th edition, 2008, Dorling Kindersley publishers, India: 1022-1037.

12. Lindon, "Introduction to medical surgical nursing" 4th edition, 2007, Elsevier publishers, New Delhi: 893-900.

13. Lewis "Medical surgical nursing" 1st edition, 2011, Elsevier publishers India: 1219-1222

14. Lippincott "Manual of nursing practice" 10th edition, 2014 wolters kluwer publishers, New Delhi: 1043-1054.

15. Luckmann's "Core principles and practice of medical surgical nursing"1st edition, 2010, Elsevier publishers: 230

16. Neelam Makhija "Introduction to Nursing Research", 2006, A.P. Jain publishers, New Delhi: 133.

17. Phipp's "Medical surgical nursing health and illness" 8th edition , 2007, Mosby Elsevier publishers, New Delhi : 1140-1148.

18. Polit Beck "Essentials of nursing research", 7th edition, 2010, Wolters Kluwer Publishers, New Delhi, 337-369.

19. Parker, Marilyn E "Nursing Theories &Nursing Practice", 2nd edition, 2007, Jaypee Brothers publishers,, New Delhi.

20. S.N. Chugh "Text book of Medical surgical nursing" 1st edition, 2013, Avichal publishers, New Delhi: 780-790

JOURNAL REFERENCE

21. Akhihiro sudo., 'Prevalence and risk factors for knee osteoarthritis in elderly Japanese men and women' Journal of orthopedic science (2008) Vol.13, Pg.No.413.

22. Bijlsma JW.,'Strategies for the prevention and management of osteoarthritis of knee' Journal of Clinical Nursing (2007) Vol.11, No.1. Pg.No59 – 76.

23. Bernacki EJ.,'Continuous heat therapy for acute muscular pain' Journal of Occupational Environmental Medicine. (2007) Vol.44, No.12, Pg.No. 1298 – 1306.

24. Brandt KD., 'Heilman DK, Slemenda C,et al.Quadricps strength in women with radiographically progressive osteoarthritis of the knee and those with stable radiographic changes' Journal of Rheumatology 1999; Vol.26, No10, Pg.No.2431-37

25. Cosgray NA., 'Effect of health modalities on Hamstring length' Journal of Orthopedic Sports and Physiotherapy. (2004) Vol;34, No.7, Pg.No.377 – 384.

26. Felson DT., 'Clinical practice Osteoarthritis of the knee' New English journal of medicine (2006) No.354, Pg.No.841-848

27. Fitzgerald GK., 'physical therapy' Journal of American Physiotherapy association, (2011) Published online, Pg.No. 452-69.

28. Jordan JM., 'Prevalence of knee symptoms' journal of Rheumatology. (2007), Vol; 37, No.1. Pg.No.172 – 180.

29. Jezussek D., 'Clinical picture and diagnosis of knee osteoarthritis' Journal of Clinical Nursing, (2007) Vol; 44, No.26, Pg.No.28 – 30.

30. Jorden J.,'Knee pain and knee osteoarthritis severity' Journal of Rheumatology (1997). Vol; 24, No.7, Pg.No.1344 – 1345.

31. Lin YC., 'Test for physical function of the elderly with hip and knee osteoarthritis'Journal of Medical Science (2007), Vol;11, No.5, Pg.No.280 – 286.

32. Lieu CM., 'squatting with prevalence of knee osteoarthritis' Journal of orthopedic nursing. (2007), Vol;28, No.2, Pg.No. 177-179.

33. Lucas B., 'Treatment option for patients with osteoarthritis of knee' British Journal of Nursing,(2005)Vol;14,No.8,Pg.No.976 – 981.

34. Law PP., 'TENS in knee osteoarthritis' Journal of Clinical Nursing. (2004) Vol.10, No.6, Pg.No.295 – 297.

35. Marlene Fransen., 'The epidemiology of osteoarthritis in Asia' International Journal of Rheumatic Diseases (2007), Vol.14, Pg.NO.113-121.

36. Sue. C Delaune., 'Thermotherapy in the management of osteoarthritis' Journal of Clinical Nursing, 2007, Vol.11, No.1, Pg.No.153 – 162.

37. Sutbeyaz.,'Effect of osteoarthritis on exercise ambulatory capacity' Journal of Rheumatology,(2007), Vol.33:,No.9, Pg.No 1835 – 1840.

38. Tsai PF., 'Gender difference in pain experiences' Journal of Gerontologic Nursing, (2007), Vol.28, No.5, Pg.No.8 – 12.

39. Tallon D., 'Symptoms and treatment of preferences of osteoarthritis' Journal of Physical Medicine Rehabilitation. (2003) Vol.25, No.6, Pg.No.408 – 410.

40. Voharanio., 'Intervention for osteoarthritis' Journal of Orthopedics, (2002). Pg.No.. 120 – 125.

41. Wang TJ.,'Effect of aquatic exercise programme' Journal of Advance nursing, (2007) Vol.7, No.2, Pg.No.141 – 152.

NET REFERENCE

http://www.ncbi.nih.gov/pupmed/22972764

http://www.ncbi.nih.gov/pupmed/23756344

http://www.ncbi.nih.gov/pupmed/19751691

http://www.ncbi.nih.gov/pupmed/19639860

http://www.ncbi.nih.gov/pupmed/22334264

http://www.hindawi.com/journals/jar/2011/374653

http://www.ncbi.nlm.nih.gov/pupmed/21551510

http://www.painresearchforum.org/papers/7507

http://www.ncbi.nlm.nih.gov/pupmed/23313532

http://www.ncbi.nlm.nih.gov/pupmed/23973143

http://arthritisresearch.com/content/15/5/R106/abstrac

http://www.ncbi.nlm.nih.gov/pupmed/23942064

http://www.thehindu.com/2007/12/27/stories

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3302040

http://www.sciencedirect.com/science/journal/10634584/21/10

Matthew Lewis The Epsom Salt Remedy for Arthritis Emed.com. Au

/Bioceutical_ ArthroGuard Published: 7/9/2008

ANNEXURES

ANNEXURE I

LETTER SEEKING PERMISSION FOR RESEARCH PURPOSE

From

301411706

II year M.SC Nursing,

Thanthai Roever College of Nursing,

Perambalur

To

The village president,

Melanalandhula village

Tirunelveli.

Respected Madam/Sir,

I am doing II year M.SC Nursing in Thanthai Roever College of Nursing perambalur, under the Tamilnadu Dr.M.G.R. Medical University Chennai. As a partial fulfillment of my M.Sc. (Nursing) Degree programme,I am going to conduct a study **"AN EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI**.I would like to select for my data collection, as I understand that I may get many patients with osteoarthritis in your village. Hence I kindly request you to grant me permission to conduct my study in your village.

Thanking you

Yours sincerely,

Place:

Date: 301411706

ANNEXURE 1I

LETTER SEEKING EXPERT'S OPINION FOR CONTENT VALIDATION

From:

301411706

II year M.SC.Nursing

Thanthai Roever college of Nursing

Perambalur

To:

Respected sir/madam,

Sub: Requisition for content validity of tool.

I am doing M.SC. Nursing II year in Thanthai Roever College of Nursing, perambalur, under the Tamil Nadu Dr.M.G.R. Medical University Chennai. As a partial fulfillment of my M.SC Nursing Degree Programme,I am conducting a research on **AN EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI**. I am submitting tool of description the above stated for your expert and valuable opinion, I will be thankful for your kind consideration.

Thanking you

Yours sincerely

301411706

Place:

Date:

ANNEXURE III

EVALUATION CRITERIA CHECK LIST FOR VALIDATION

INTRODUCTION

The expert is requested to go through the following criteria for evaluation. Three columns are given for response and a column for the remark. Place tick mark in the appropriate column and given remarks.

INTERPRETATION OF COLUMN

Column1 : Meets the criteria.

Column II : Partially meets the criteria

Column III : Does not meet the criteria

SI.NO	Criteria	1	2	3	Remarks
1	Scoring - Adequacy - Clarity - Simplicity				
2	Content - Logical sequence - Adequacy - Relevance				
3	Language - Appropriate - Clarity - Simplicity				
4	Practicability - It is easy to score - Does it precisely - Utility				

Signature: Any other suggestion

Name :

Designation:

Address:

ANNEXURE IV

LIST OF EXPERT'S OPINION FOR CONTENT VALIDITY OF RESEARCH TOOL

1. Prof.R.Punithavathi. M.Sc.(N)
   Principal,
   Thanthai Roever College of Nursing,
   Perambalur.

2. Prof.V.J.Elizabeth.M.Sc.(N)
   Vice principal,
   Thanthai Roever College of Nursing,
   Perambalur.

3. Dr.Rajina Rani M.Sc.(N), Phd
   Principal,
   RAASU Acadmy college of nursing
   Poovanthi

4. Prof.M.Shanthi M.Sc (N)
   Dr.G.Sagunthala college of Nursing
   Tirchy.

5. Prof.K.S.Pushpalatha M.Sc (N)
   Shanmuga College of Nursing
   Salem.

ANNXURE V (A)

CERTIFICATE OF ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation work **AN EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAGE AT TIRUNELVELI** done by 301411706 II year M.Sc. Nursing, in Thanthai Roever College of Nursing, Perambalur is edited for English language appropriateness.

Signature

ANNEXURE V (B)

CERTIFICATE OF TAMIL EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the dissertation work **AN EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF EPSOM SALT FOMENTATION ON KNEE RELATED SYMPTOMS AMONG PATIENTS WITH KNEE OSTEOARTHRITIS IN SELECTED VILLAG AT TIRUNELVELLI done** by 301411706 II year M.SC. Nursing, in Thanthai Roever College of nursing, Perambalur is edited for Tamil language appropriateness

Signature

ANNEXURE - VI

ஒப்புதல் படிவம்

பெரம்பலூர் தந்தை ரோவர் செவிலியர் கல்லூரியில் முதுகலை பட்டபடிப்பு பயிலும் **301411706** அவர்களால் நடத்தப்படுகின்ற, முழங்கால் மூட்டு சேதம் மற்றும் எலும்பு பலவீனம் மூட்டு வீக்கம் ஆகியவற்றிற்கான உப்பு ஒத்தடம் சிகிச்சை சம்பந்தமான ஆராய்ச்சியின் நோக்கத்தினைப் பற்றியும் சிகிச்சை பற்றிய விளக்கமும் எனக்கு தெளிவாக தெரிவிக்கப்பட்டது. இதில் பங்கேற்பதற்கு எனக்கு எந்தவித ஆட்சேபனையும் இல்லை. மேலும் இந்த விவரங்களை வெளியிடுவதற்கும் அச்சிடுவதற்கும் முழு சம்மதம் அளிக்கிறேன்.

கையெழுத்து

பெயர் :
தேதி :
இடம் :

ANNEXURE – VII (A)

DATA COLLECTION TOOL ENGLISH

SECTION-A DEMOGRAPHIC DATA

Sample no:

Kindly furnish the following details by placing a tick (✓) mark in appropriate choice

1] AGE IN YEARS

a] 41-50 ☐

b] 51-60 ☐

c] 61-70 ☐

d] 71-80 ☐

2]GENDER

a] Male ☐

b] Female ☐

3]TYPE OF WORK

a] Sedentary work ☐

b] Moderate work ☐

c] Heavy work ☐

4]BODY MASS INDEX

a] Under weight ☐

b] Normal weight ☐

c] Over weight ☐

5] DURATION OF KNEE OSTEOARTHRITIS IN YEARS

a] <1 ☐

b] 1-3 ☐

c] 4-5 ☐

d] >5 ☐

6] TREATMENT FOR OSTEOARTHRITIS

a] Drugs ☐

b]Physiotherapy ☐

c] Both ☐

d] No Treatment ☐

SECTION-B

MODIFIED KNEE INJURY AND OSTEOARTHRITIS OUTCOME SCORE

Kindly tick the (✓) appropriate answer:

SYMPTOMS	Score 0	Score 1	Score 2	Score 3	Score 4
How severe is your knee stiffness after first wakening in the morning?	None	Mild	Moderate	Severe	Extreme
How severe is your knee stiffness after sitting, lying, or resting later in the day?	None	Mild	Moderate	Severe	Extreme
Do you have swelling in your knee?	Never	Rarely	Sometimes	Often	Always
Do you feel grinding, hear clicking or any other type of noise when your knee moves?	Never	Rarely	Sometimes	Often	Always
Does your knee catch or hang up when moving?	Never	Rarely	Sometimes	Often	Always
Can you straighten your knee fully?	Always	Often	Sometimes	Rarely	Never
Can you bend your knee fully?	Always	Often	Sometimes	Rarely	Never

What degree of pain have you experienced the last week when…?					
PAIN	**Score 0**	**Score 1**	**Score 2**	**Score 3**	**Score 4**
Twisting/pivoting on your knee	None	Mild	Moderate	Severe	Extreme
Straightening knee fully	None	Mild	Moderate	Severe	Extreme
Bending knee fully	None	Mild	Moderate	Severe	Extreme
Walking on flat surface	None	Mild	Moderate	Severe	Extreme
Going up or down stairs	None	Mild	Moderate	Severe	Extreme
At night while in bed	None	Mild	Moderate	Severe	Extreme
Sitting or lying	None	Mild	Moderate	Severe	Extreme
Standing upright	None	Mild	Moderate	Severe	Extreme

Total Score:

0-15	-	Mild level of knee related symptoms
16-30	-	Moderate level of knee related symptoms
31-45	-	Severe level of knee related symptoms
46-60	-	Extreme level of knee related symptoms

ANNEXURE – VII (B)

DATA COLLECTION TOOL TAMIL

தகவல் சேகரிப்பு படிவம்

பகுதி - அ

சொந்தக் குறிப்பு:

கீழே கேட்கப்பட்ட விபரங்களை படித்து சரியான இடத்தில் ✓ குறியிடவும்

1 **வயது (வருடங்களில்)**

அ. 41-50 ☐

ஆ. 51-60 ☐

இ. 61-70 ☐

ஈ. 71-80 ☐

2 **பாலினம்**

அ.ஆண் ☐

ஆ.பெண் ☐

3 **உடல் உழைப்பின் வகை**

அ.இலகுவான வேலை ☐

ஆ.மிதமான வேலை ☐

இ.கடினமான வேலை ☐

4 **உடல் நிறை குறியீட்டெண்**

அ.குறைவான எடை ☐

ஆ.சரியான எடை ☐

இ.அதிக எடை ☐

ஈ.உடல் பருமன் ☐

5 **மூட்டு வலியின் காலஅளவு வருடங்களில்**

அ. <1 ☐

ஆ. 1-3 ☐

இ., 3-5 ☐

ஈ., > 5 ☐

6 **மூட்டு வலிக்கு எந்தவிதமான சிகிச்சை எடுத்துக் கொண்டீர்கள்?**

அ.மாத்திரை ☐

ஆ.இயன்முறை சிகிச்சை ☐

இ.இரண்டும் ☐

ஈ.எதுவும் இல்லை ☐

பகுதி – ஆ

வடிவமைக்கப்பட்ட வினாத்தாள்

கீழே கொடுக்கப்பட்ட கேள்விகளுக்கு சரியான விடையை (✓) குறிக்கவும்

நோய் அறிகுறிகள்	மதிப்பெண் 0	மதிப்பெண் 1	மதிப்பெண் 2	மதிப்பெண் 3	மதிப்பெண் 4
காலையில் நீங்கள் முதல் தடவையாக படுக்கையில் இருந்து எழும்போது உங்கள் முழங்கால் இணைப்புகளின் விறைப்புத் தன்மை எவ்வளவு கடினமாக இருந்தது	எதுவும் இல்லை	சிறிதளவு மென்மையாக இருந்தது	மிதமானதாக இருந்தது	கடுமையாக இருந்தது	மிகவும் கடுமையாக இருந்தது
பகலின் பிற்பகுதியில் (மாலை நேரங்களில்) உட்கார்ந்தபோதும் படுத்துக்கொண்டு இருந்தபோதும் ஓய்வு எடுத்துக்கொண்டிருந்த போதும் விறைப்பு எப்படி இருந்தது?	எதுவும் இல்லை	சிறிதளவு மென்மையாக இருந்தது	மிதமானதாக இருந்தது	கடுமையாக இருந்தது	மிகவும் கடுமையாக இருந்தது
உங்கள் முழங்கால் மூட்டில் வீக்கம் இருந்ததா?	எப்போதும் இல்லை	எப்போதோ ஒருதடவை இருந்தது	சில நேரங்களில் இருந்தது	அடிக்கடி இருந்தது	எல்லா நேரங்களிலும் இருந்தது
உங்கள் முழங்கால் அசைக்கப்பட்ட பொழுது உராய்வுசத்தம் அல்லது கிளிக்கிளிக் சப்தம் அல்லது வேறு ஏதாவது சத்தம் கேட்டதா?	எப்போதும் இல்லை	எப்போதோ ஒருதடவை இருந்தது	சில நேரங்களில் இருந்தது	அடிக்கடி இருந்தது	எல்லா நேரங்களிலும் இருந்தது
நடக்கும் பொழுது உங்கள் முழங்கால்மூட்டு பிடித்துக்கொண்டதா?	எப்போதும் இல்லை	எப்போதோ ஒருதடவை இருந்தது	சில நேரங்களில் இருந்தது	அடிக்கடி இருந்தது	எல்லா நேரங்களிலும் இருந்தது
உங்கள் முழங்காலை முழுதுமாக நீட்ட முடிந்ததா?	எல்லா நேரங்களிலும் முடிந்தது	அடிக்கடி முடிந்தது	சிலநேரங்களில் முடிந்தது	எப்போதாவது ஒருமுறை மட்டும்	எப்போதும் முடியவில்லை
உங்கள் முழங்காலை முழுதுமாக வளைக்க முடிந்ததா?	எல்லா நேரங்களிலும் முடிந்தது	அடிக்கடி முடிந்தது	சிலநேரங்களில் முடிந்துத	எப்போதாவது ஒருமுறை மட்டும்	எப்போதும் முடியவில்லை

கடந்தவாரம் அடியில் குறிப்பிடப்பட்டுள்ள வேலைகளைச் செய்தபோது உங்கள் முழங்கால்மூட்டுவலி எந்த அளவிற்கு இருந்ததை உணர்ந்தீர்கள்?					
முழங்கால்மூட்டு வலி	மதிப்பெண் 0	மதிப்பெண் 1	மதிப்பெண் 2	மதிப்பெண் 3	மதிப்பெண் 4
உங்கள் முழங்காலைத் திருப்பிய போதும் சுழற்றியபோதும்.	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
முழங்காலை முழுமையாய் நேராக நீட்டியபோது எப்படிஇருந்தது?	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
முழங்காலை முழுவதுமாக வளைத்தபொழுது	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
சமதளத்தில் நடந்தபோது	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
மாடிப்படிகளை ஏறும்போது அல்லது இறங்கும்போது	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
இரவுநேரத்தில் படுக்கையில் படுத்துக்கொண்டு இருக்கும்போது	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
உட்கார்ந்துகொண்டு அல்லது காலைபரப்பிக் கொண்டு உள்ளபொழுது	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது
எழுந்து நிற்கும் பொழுது	வலி இல்லை	சிறிதளவு வலி இருந்தது	மிதமான வலி இருந்தது	அதிகமான வலி இருந்தது	கடுமையான வலி இருந்தது

மொத்த மதிப்பெண்

0-15 - லேசான முழங்கால் தொடர்பான அறிகுறிகள்

16-30 - மிதமான முழங்கால் தொடர்பான அறிகுறிகள்

31-45 - கடுமையான முழங்கால் தொடர்பான அறிகுறிகள்

46-60 - தீவிர முழங்கால் தொடர்பான அறிகுறிகள்